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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/550,507

10/24/2005

Anja Blondeel

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EXAMINER

BAND, MICHAEL A

ART UNIT

PAPER NUMBER

1795

MAIL DATE

DELIVERY MODE

07/17/2009

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/550,507	Applicant(s) BLONDEEL ET AL.	
	Examiner MICHAEL BAND	Art Unit 1795	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 19 May 2009.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-19 is/are pending in the application.
- 4a) Of the above claim(s) 3, 6-9, 14, and 16-17 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1, 2, 4, 5, 10-13, 15, 18 and 19 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>5/19/2009</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

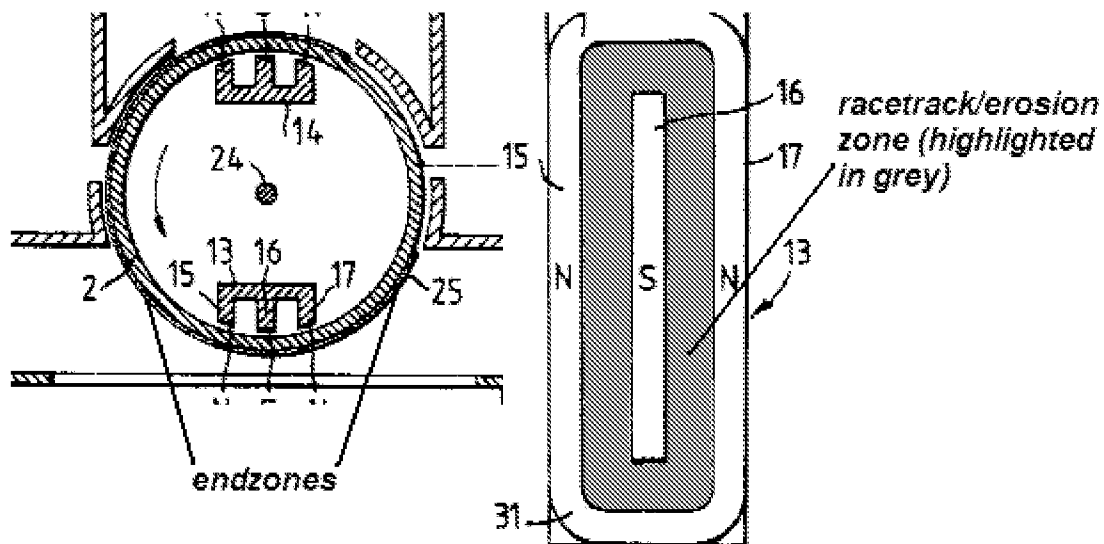
2. Claims 1-2, 4-5, 10-13, 15, and 18-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Szczyrkowski (US Patent No. 5,558,750) in view of Wang et al (US Patent No. 6,358,851).

With respect to claims 1-2, 4-5, and 18-19, Szczyrkowski discloses a sputtering chamber [3] comprising a cylindrical, rotating target (i.e. electrode/cathode) [25] connected to a power source [23], a substrate [22], and a vacuum pump [12] for said sputtering chamber [3] (abstract; fig. 1). However Szczyrkowski is limited in that a device being in relative motion to the electrode is not suggested.

Wang et al teaches a method for the removal of metal residue or nodules from surfaces of a sputter target, where a polishing bit (i.e. device) is applied in a rotating manner to said surface of said sputter target to remove said nodules (abstract). Wang et al also teaches the surface of the polishing bit is coated with a material that provides an abrasive action (col. 5, lines 60-67; col. 6, lines 1-4), thus the polishing bit must have a hardness greater than or equal to the hardness of the sputter target in order to remove the nodules. Wang et al cites the advantage of using the polishing bit to remove nodules as improving target yield and reliability (col. 2, lines 26-51).

It would have been obvious to one of ordinary skill in the art to use the polishing bit taught in Wang et al to clean the sputter target of Szczyrkowski to gain the advantages of superior target yield and reliability.

With respect to claims 10-12, modified Szczyrkowski further discloses in fig. 1 a permanent magnet array [13] behind the target [25], where fig. 2 depicts said permanent magnet array as a racetrack which is also the erosion zone. Fig. 1 also depicts an endzone on both sides of the permanent magnet array [13] that is not sputtered since no magnetic field is present to trap a plasma against the target [25] surface. The cropped figures below of figs. 1-2 serve to further clarify the endzone, racetrack, and erosion zones.



With respect to claim 13, modified Szczyrkowski further discloses the target [25] material being an ITO material (col. 2, lines 56-64).

With respect to claim 15, Wang et al further teaches applying the polishing bit in a rotating manner to the target surface (abstract) when the polishing bit surface [36] is

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brought in contact with said target surface (col. 5, lines 64-67; col. 6, lines 1-4), thus said polishing bit is brought into intermittent contact with said target surface.

Response to Arguments

Specification

3. The proposed amendments to the Specification filed 5/19/2009 are accepted.

103 Rejections

4. Applicant's arguments filed 5/19/2009 have been fully considered but they are not persuasive.

5. On p. 6-7, the Applicant argues that Wang et al does not teaching providing a device in a vacuum. The Applicant also argues that since Wang et al teaches in steps 18-20 the chamber being cycle purged, baked out, and burned out, said steps imply that the vacuum must have been broken because said steps result in the vacuum being restored.

The Examiner respectfully disagrees. Wang et al teaches in fig. 1 that steps 14-17 happen together (col. 4, lines 48-67), with step 14 teaching maintain vacuum as steps 16 of applying the polishing takes place (col. 5, lines 1-9). There is no mention or teaching Wang et al that the vacuum environment is not present between step 14 and step 16. Regarding the implications of steps 18-20, Wang et al does not mention that vacuum is being restored; steps 18-20 are meant to fully clean the chamber by getting

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rid of excess nitrogen gas, particles dislodged, and isopropyl alcohol cleaner (col. 5, lines 20-28).

6. On p. 7, the Applicant argues that the nitrogen gas used to dislodge particles is then removed by the application of a vacuum. The Applicant also argues that since isopropyl alcohol is used for cleaning, a vacuum cannot be used.

The Examiner respectfully disagrees. Wang et al teaches in step 18 a purging of the nitrogen gas; the purging merely cleans the chamber of the nitrogen gas and is not the reconstitution of the vacuum environment. As further evidence, sputtering is well known to be conducted with nitrogen gas being injected into the chamber and the chamber being at a vacuum, thus just because the purging of the nitrogen gas happens does not imply that the chamber is being reconstituted to a vacuum but rather said vacuum is being maintained. Regarding a vacuum not being present due to the addition of isopropyl alcohol, the Examiner does not understand the argument as to why this alcohol cannot be injected or sprayed into the chamber at a vacuum pressure and then evaporated to a gas and purged during steps 18-20.

7. On p. 7, the Applicant argues that since Wang et al teaches adding or removing processing tools, a vacuum being broken is implied.

The Examiner respectfully disagrees. Wang et al teaches that the polishing step can take place during adding or removing other processing (col. 3, lines 20-42); this merely means that the polishing step has the capability to perform during other steps but does not necessarily do so. Regarding this implying the vacuum being broken, if the polishing, and thereby the addition of nitrogen gas, step did not take place in vacuum

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due to the vacuum being broken, then the nitrogen gas would escape outside the chamber and contaminate the outer environment. Therefore the implication does not seem reasonable.

8. On p. 8, the Applicant argues the interpretation of the PTO regarding 'end zone' and 'erosion zone' is incorrect since Applicant's Specification teaches no target material being sputtered in the 'end zone'. The Applicant also argues that the Specification teaches that target material is never sputtered from the 'end zone' and that the 'erosion zone' is not limited to the race track but to the whole circumferential area of the tubular target.

The Examiner respectfully disagrees. After reviewing the designated section of the Applicant's Specification, it has been found that said Specification does not teach the 'end zone' never being sputtered even when turning nor the 'erosion zone' being the whole circumferential area of the tubular target. In addition, neither of these are claimed. However as stated above, the end zones designated by Szczyrkowski are never sputtered since the magnet is not rotated with the entire target being in the erosion zone since said target is rotated. Therefore the interpretation above is appropriate.

Conclusion

9. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within

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TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michael Band whose telephone number is (571) 272-9815. The examiner can normally be reached on Mon-Fri, 9am-5pm, EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Alexa Neckel can be reached on (571) 272-1446. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

11. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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/M. B./

| Examiner, Art Unit 1795

/Jennifer K. Michener/

Supervisory Patent Examiner, Art Unit 1795